Applied Hydraulics Software

1. **Course number and name:** 020LOGGS5 Applied Hydraulics Software

2. **Credits and contact hours:** 2 ECTS credits, 1x1.25 hours

3. **Name(s) of instructor(s) or course coordinator(s):** Antoine HREICHE

4. **Instructional Materials:**

   - Computer Applications in Hydraulic Engineering - Eighth Edition– Tom Walski

5. **Specific course information**
   a. **Catalog description:** Computer Applications in Hydraulic Engineering is an all-inclusive water resources guide for students in the hydraulics and hydrology fields. It links theory with real-world applications through exercises and examples of the technology, theory, and analysis methods at the forefront of hydraulic engineering. The examples cover everything from hydraulic theory to detention pond design, dynamic modeling, culvert hydraulics, and more.

   b. **Prerequisites or co-requisites:** None

   c. **Required:** Required major course for Water and Environment Specialty students

6. **Educational objectives for the course**
   a. **Specific outcomes of instruction:**
   - Understand the theory and applications for the design of hydraulic structures and related appurtenances.
   - Understand methods of stromwater drainage and design criteria,
   - Watershed delineation
   - Determine the flows for various return period
   - Design hydraulic structures (channel, ditches, ponds, culvert, bridges, dams, spillways, road drainage)
   - Understand professional and ethical responsibility
   b. **PI addressed by the course:**

PI	1.1	1.4	2.3	3.1
Covered	yes	yes	yes	yes
Assessed				

7. **Brief list of topics to be covered:**
   - Introduction (1h15)
   - Basic Hydraulics (1h15)
   - Basic Hydrology (2h30)

- Watershed delineation using ArcGIS (2h30)
- Flow calculations: SCS method (HEC-HMS) (1h15)
- Design of hydraulic structures (FlowMaster) (1h15)
- Culverts (CulvertMaster) (2h30)
- Design of Bridges/Dams (HEC-RAS) (2h30)
- Design of ponds (Pondpack) (2h30)